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REPORT ON THE DIVISION OF PHYSICAL-CHEMICAL AND ENGINEERING SCIENCES

- USSR -

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FOREWORD

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REPORT ON THE DIVISION OF PHYSICAL-CHEMICAL AND ENGINEERING SCIENCES

- USSR -

Following is the translation of a series of briefs in Trudy Akademii nauk Litovskoy SSR (Works of the Academy of Sciences of the Lithuanian SSR), Vol B2 (25), Vilnius, 1961, pp. 281-290. Authors of the individual briefs are given at the beginning of each article.

Introduction

(by K. Konstantinavicius)

The scientific research work at the institutes of the division in 1960 covered 28 major problems, encompassing 110 topics. 55 of the topics were brought to completion. Significant results were obtained in the study of limiting theorems on inhomogeneous Markov chains, electron transition probabilities in atoms for various types of bonds, investigation of the mechanism of cathode reactions in the electro-deposition of cobalt, on the division of the territory of the Lithuanian SSR into districts according to landscape, determining the hydropower characteristics of Lithuanian rivers, on the transfer of heat from various objects in a fluid flow, and on the development of a methodology for the districtwise architectural planning of the republic.

The results of the scientific investigations have been published in scientific journals and collections of articles (more than 200 articles have been published). In addition, the institutes of the division have published 17 monographs and collections of articles, totaling 220 printer's sheets (3520 pages), of which deserving mention is Kadastr rek Litovskoy SSR [Survey of Lithuanian Rivers], Vol 2, and a collection of articles covering the sessions of the International Geological and International Geographical Congresses.

In 1960, 12 members of the institutes of the division successfully defended candidate's dissertations.

The institutes tested and introduced into industry the results of 11 scientific papers. Moreover, members of the institutes served as consultants for industrial workers, conducted laboratory investigations on problems of the industrial organizations, and served on commissions dealing with the problems of the development of industry and building in the Republic.

In 1960, the General Convocation of the division held three meetings, at which summaries of the work of the institutes and members of the division in 1959, the plans for scientific research in 1961, and other problems connected with the completion and expansion of scientific research, the training of scientists, the more rapid utilization of scientific work, etc., were discussed and evaluated. Elected to the post of academic secretary of the division was Academician A. Jucys, to positions on the staff of the division were Academicians P. Brazdziunas and I. Janickis, Corresponding Members of the Academy of Sciences S. Vabaliavicius and A. Zukauskas; directors of the Institutes: of Physics and Mathematics, Academician A. Jucys, of Chemistry and Chemical Engineering, Academician J. Matulis, of Geology and Geography, Academician K. Beliukas, of Power and Electrical Engineering, Corresponding Member of the Academy of Sciences A. Zukauskas, of Building and Architecture, Candidate of Engineering Sciences I. Sabaliauskas.

On 4 July 1960, a meeting of the General Convocation of the division was held in honor of the 20th anniversary of the Lithuanian Soviet Socialist Republic. Taking part in the business of the meeting were academicians and corresponding members of the division, scientists of the institutes, and guests, totaling about seventy persons in all.

Academic Secretary of the Division A. Jucys opened the meeting with a survey of the development in scientific institutions during the years of the Soviet regime and the work that had been accomplished. Eleven papers on the development of science and industry in the Republic during the Soviet regime were presented: by Prof. I. Kubilius on "Mathematics in Soviet Lithuania," by Academician P. Brazdziunas on "The Growth of Scientific Activity in Physics in Soviet Lithuania," by R. Visomirskis on "The Significance of Electrochemistry and its Development in Soviet Lithuania," by J. Kisnerius on "What is Being Done and What is to be Accomplished in Geology in Soviet Lithuania," by Academician K. Beliukas on "What is Being Done and What is to be Accomplished in Geography in Soviet Lithuania," by B. Styro on "Advances in Geophysics in Soviet Lithuania and the Outlook for the Nearest Future," by Corresponding Member of the Academy of Sciences A. Zukauskas on "The Tremendous Prospects for the Growth of Power Engineering in the Lithuanian SSR," by V. Daukins and K. Ragulskis on "The Machinery Industry of the Lithuanian SSR and its Goals for Future Development," by A. Nemura on "The Over-All Mechanization and Automation of Industry in the Lithuanian SSR," by I. Sabaliauskas on "The Development of Building in the Lithuanian SSR and Outlook for the Nearest Future," by I. Barsauskas on "The Investigation and Scientific Evaluation of Architectural Tradition in Soviet Lithuania."

At the meetings of the division staff current issues in the business of the institutes, the prospects for future growth of science, better planning, and other problems were taken up and evaluated.

Report on the Institute of Physics and Mathematics

(by A. Kanceriavicius)

Scientific research at the institute was conducted in six problem areas, involving 18 topics, and was concentrated primarily on solving the more vital problems in the theory of probability and mathematical statistics, variable stars, quantum theory of the atom and nucleus, high-speed mathematical computers, and the physics of semiconductors. Studies were begun on mathematical linguistics, nuclear theory, and the design of electronic computers. Eight of the planned studies and ten extra studies were completed.

Four planned and five extra papers were completed on the problem "Development of Procedures in the Theory of Probability and Mathematical Statistics and Their Application in Engineering and Industry." Necessary and sufficient conditions were obtained for the applicability of a sequence of independent unequally distributed random variables to a region of stable gravitational attraction (author: A. Mitalauskas). Kolmogorov's inequality was generalized for dependent random quantities of the Levy martingale type (R. Uzdavinis), large deviations were obtained for entering into the state of a finite inhomogeneous chain (V. Statuliavicius), it was proven that short Dirichlet sums of polynomials with integer coefficients represent within limits the Brownian motion (I. Kubilius). In the completed extra papers Cramer's theorem was extended to additive arithmetic functions (I. Kubilius), necessary and sufficient conditions were found for the existence of large deviations of the Cramer type (V. Statuliavicius), the rate of convergence to a normal law of the additive arithmetic functions of irreducible integer polynomials was evaluated (R. Uzdavinis), algorithms were found, defining the reliability of logical formulas for a concrete model (V. Matulis), some methods of solution of differential equations were studied (B. Kviadaras and L. Stupialis).

On the problem "Atomic and Molecular Spectroscopy and its Application for the Analysis of Composition and State of Substances" four papers, including three extraprovisional ones, were completed. The problem of simultaneous two-electron transitions were studied theoretically in the example of Ca and Th^+ , using the methods of incomplete separation of variables and the many-configuration approximation (K. Uspalis and I. Ciplis); in other studies an idea was proposed for amplifying on the methods of Hartree and Fok by application of different radial one-electron functions in the same shell (Academician A. Jucys, J. Vizbaraite, K. Eringis), the problem of electron transitions between configurations in which there are different types of bonds was considered, and the selection rules for such transitions were established (Academician A. Jucys, J. Vizbaraite, and I. Ciplis), and the symmetry of j-tensors was studied (V. Vanagas and I. Vatarunas).

On the problem "High-Speed Digital Computers" one paper was written. A program was set up for solving self-consistent field equations by stages on the "Strela-3" and "BESM-2" electronic computers. With the help of this program the wave functions of certain atoms and ions were computed.

Two planned and two extra studies were completed on "Semiconductors and Their Engineering Application." In the theoretical papers dealing with this problem the local and spatial symmetry of the crystal lattice was used to study paramagnetic resonance and the band structure of current carriers (I. Levinson and I. Batarunas), the connection between various models of the exciton were investigated and a new model proposed (I. Levinson), criteria were also found for level degeneracy, along with additional selection rules in the magnetic field (I. Levinson). In the experimental studies on this problem a large-scale investigation of the properties of cadmium telluride thin films was conducted (V. Tolutis, K. Valacka, I. Grinkaite, V. Jasutis, E. Kucys, A. Sileika, and E. Simulite). The results of this study will promote understanding of the physical effects in thin semiconducting films and provide the opportunity of utilizing these films in the design of miniature semiconductor devices.

A monograph was written under the title Matematicheskiy apparat teorii momenta kolichestva dvizheniya /Mathematical Apparatus of the Theory of Moments of Momentum/ (Academician A. Jucys, I. Levinson, V. Vanagas), and a reference book was compiled and published in cooperation with the Computer Center of the Academy of Sciences USSR: Tablitsy chislennykh znacheniy radial'nykh integralov teorii atomnykh spektrov (Tables of Numerical Values of Radial Integrals in the Theory of Atomic Spectra) (I. Glembockis, V. Vanagas, and K. Uspalis). 31 scientific articles were published in periodicals during 1960, and 46 articles appeared in print.

The Second All-Republic Conference of Mathematicians and Fourth Conference of Physicists were dedicated to the 20th anniversary of Soviet Lithuania. An event significant for the development of astronomy in the Lithuanian SSR was the convocation of the Council of Astronomy of the Academy of Sciences USSR, which was held in Vilnius 23-28 August. A major event in the life of the mathematicians of the republic was the Sixth All-Union Conference on the Theory of Probability and Mathematical Statistics, held in Vilnius 5-10 September.

Members of the institute also took an active part in more than 12 scientific conferences and meetings outside the Republic; a total of more than 35 reports and scientific communications were heard at these conferences.

Two junior scientists defended their candidatorial dissertations: K. Makariunas on the topic "Investigation of the Mechanism of the Reactions (α, α'), (α, p), (α, d), and (α, t) in Lithium Nuclei," and A. Sileika on "Optical Properties of Sb_2S_3 and Sb_2Se_3 Films."

Members of the institute, acting as fellows of the Society for the Promulgation of Political and Scientific Information, during 1960 gave a total of about 80 lectures and reports, published more than 60 lay articles and brief notes in periodicals, and made more than 30 appearances on radio and television.

Report on the Institute of Chemistry and Chemical Engineering

(by F. Aleinikov)

At the institute 23 topics in five problem areas were under way, including one topic on the instructions of the Council of Ministers of the Lithuanian SSR, and one topic was completed jointly with the Institute of Organic Chemistry, Czechoslovakian Academy of Sciences. Nine planned and eight extra papers were completed, one of the latter was adopted in industry.

On the problem "Theory of Electrochemical Processes and its Application to the Electrodeposition of Metals and Chemical Current Sources" two planned studies and one extra one were completed.

Here attention was focused primarily on the mechanism for the cathode reactions occurring in the electrodeposition of cobalt and the procurement of galvanic films with definite properties (A. Badnevas), the dispersion of reactive substances in the near-cathode layer during electrodeposition of zinc from sulfuric acid solutions (V. Racinskas). The investigations not only confirmed earlier notions as to the role of colloidal chemical processes occurring in the near-cathode layer during the electrodeposition of cobalt, but also provided an opportunity for developing optimum conditions for obtaining high-quality lustrous cobalt deposits.

A new concept was brought forward concerning the role of colloidal chemical processes occurring in the near-cathode layer in the formation of lustrous zinc galvanized coatings.

Moreover, a galvano-plastic method of fabricating parts from copper on steel mountings was incorporated into industry (O. Galdikene). The Committee on Inventions and Discoveries of the Council of Ministers USSR awarded a copyright to the authors of this method, Academician J. Matulis and O. Galdikene.

On the problem "Processes of Generation and Decomposition of Unstable Inorganic Compounds" three topics were completed.

In the study of the catalytic decomposition of certain chlorites (P. Norkus) the catalytic decomposition of alkaline solutions of calcium, strontium, and barium chlorites was investigated in the presence of hydroxide catalysts (nickel, cobalt, copper, and iron hydroxides), along with the dependence of the catalytic decomposition of chlorites of alkaline earth metals in an alkaline medium in the presence of one- and two- component hydroxide catalysts on the pH of their solutions.

In a paper entitled "Properties and Conditions Underlying the Formation of Certain Compounds of Trivalent Copper," (A. Prokopcik and G. Rozovskis) strontium cupriate was synthesized by oxidation of copper hydroxide with hypochlorite in the presence of a strontium cation, then barium cupriate was synthesized by anode oxidation of copper in alkaline solutions.

In studying the adsorption of certain organic substances from

aqueous solutions on silica gel (D. Poskus), isotherms were measured for the adsorption of methyl blue cations and chlorine anions from aqueous solutions of methyl blue chlorite on large-porous silica gel.

One extraprovisional study was also completed on "The Arsenitic Analysis of Chlorites with the Application of an OsO_4 Catalyst" (P. Norkus).

Members of the Inorganic Chemistry Section, A. Prokopcik and G. Rozovskis, were awarded a copyright by the Committee on Inventions and Discoveries of the Council of Ministers USSR for their development of a method of dying synthetic fiber (nitron).

On the problem "A Composite Study of Mineral Reserves and Methods and Processes for Their Utilization for the Building Materials Industry" two planned studies were completed.

In the investigation of the kinetics of the formation of calcium hydroxylates stable at low steam pressures (J. Vaitkus) it was established by thermographic and thermogravimetric methods that the alpha-hydrate of dicalcium silicate is formed in a mixture of lime and silica not only at low saturated steam pressures (at a temperature of 160° and below), but also at high pressures (at 170° and higher).

In the study (Investigation of the Processes of Formation of Portland Cement Clinker Minerals Upon Heating of the System CaSO_4 -- SiO_2 -- Al_2O_3 -- Fe_2O_3 --C (V. Latvīš) it was found that the x-ray diffraction method is suitable for determining the mineral composition of Portland cement clinker made from anhydrite. The following order of formation of the minerals was determined: CaOAl_2O_3 , 2CaOSiO_2 and $2\text{CaOFe}_2\text{O}_3$, $4\text{CaOAl}_2\text{O}_3$, Fe_2O_3 and $3\text{CaOAl}_2\text{O}_3$, 3CaOSiO_2 .

Moreover, six extra studies were completed, the greater part of which were studies of the feasibility of expanding the natural resources of the Republic for the production of building materials.

On the problem "Investigation and Synthesis of Biologically Important Natural Compounds" one joint topic, "Synthesis of the Analogs of Vitamin A" (G. Kugatova, G. Laumianskias, G. Krasilnikova, P. Kaikaris, V. Mozolis, V. Lucenko, Z. Alaune, V. Vidugirene, and R. Poskene) was completed. In the study the transition was made from ketones or ketols obtained by condensation of Δ^3 -cyclohexanals with acetylene to the corresponding tertiary acetylene alcohols and further to the primary bromides, the condensation of which from sodium with ethyl acetoacetate, repeated ethynylation and then isomerization led to the procurement of a number of analogs of vitamin A.

In the examples of Δ^3 -cyclohexene aldehydes and their acetals the possibility of reordering the ring double bond from the position Δ^3 to the position Δ^6 was investigated.

The condensation of the acetals of 4-methyl- Δ^3 -cyclohexene aldehyde with vinyl ethers was investigated and polyene aldehydes, acids, and ethers -- analogs of the aldehyde, acid, and ether of vitamin A -- were obtained. Moreover, in conjunction with the Organic Chemistry Institute, Czechoslovakian Academy of Sciences, spectrographic investigations were run on the aromatic and hydroaromatic aldehydes and their derivatives.

On the problem "Scientific Principles for Obtaining High-Molecular

Compounds and Materials Made from These" one study, "An Investigation of the Methods for Obtaining Tanning Materials from Industrial Waste" (K. Blazis and L. Kurkulite) was completed. In this study the tannin content of bark obtained from the peeling of spruce for paper pulp at the Klaipeda Pulp Plant and Grigis Paper Factory was investigated. It was found that in the bark an average of 4-5% tannin is detected and that the optimum amount of tannin is extracted at a temperature of 100°. In the evaporation process the dispersion of the tannin particles increases with lowering of the evaporation temperature.

Members of the institute published 45 scientific articles and readied another 58 for print in all-Union and all-Republic scientific journals. The works of the All-Union Conference on Problems in the Chemistry of Terpens and Terpenoids, held in Vilnius on 4-6 June 1959, was also published.

In conjunction with the appropriate scientific and industrial institutions of the Republic and other organizations, the institute took part in four conferences, including the Second All-Republic Conference of Galvanization Chemists, attended by scientists and technicians, a conference on the problems of the chemical reprocessing of industrial waste materials, etc., at which members of the institute presented 15 reports.

Three graduate students defended their candidate's dissertations: A. Sadunas on "The Decomposition of Potassium Persulfate Under the Action of Hydroxide Catalysts," V. Lucenko on "Allyl Bromination of Compounds in the Δ 3-Cyclohexene Series," and Z. Alaune on "An Optical Investigation of the Mutual Effect of Atomic Groups in Molecular Organic Compounds." In addition, Junior Scientist V. Mozolis defended his dissertation on "The Synthesis and Investigation of Certain Ketones and Acetylene Alcohols of the Cyclohexene Series."

Report on the Institute of Geology and Geography

(by C. Garbaliuskas)

In 1960 work was done on ten problem areas, covering 29 topics; investigations on 15 topics were completed.

On the problem "Unified Stratigraphic Range of the USSR" the studies were directed toward investigating the stratigraphy of the Permian Period and Mesozoic era, the ichthyofauna of the Devonian period, the lithologic and geochemical features of francium deposits in the Lithuanian SSR (J. Kisnerius, A. Venozinskene, L. Rotkite, A. Garunkstis, P. Suveizdis), and a catalog was compiled of rifts and outcrops from the pre-Quaternary age in the territory of the Lithuanian SSR (J. Kisnerius).

On the problem "Geographic Survey of the USSR" the material composition of lake-bottom soils in the southeastern part of the Lithuanian SSR were studied (V. Cepulite, A. Gaigalas, A. Klimasauskas), and geomorphological studies were made on the terrace structure of the Nemunas

River valley from Druskininkai to the mouth (L. Micas).

On the problem "Regularities in the Allocation of Subterranean Waters in the Earth's Crust" an abundant collection of research materials was subjected to scientific treatment and generalization, and maps of underground waters were drawn up (A. Ignatavicius).

On the problem "Investigation of the Geography of the Lithuanian SSR" four topics were completed. Joint investigations were conducted on the separate genetic kinds of lakes in the Lithuanian SSR (K. Beliukas, E. Cervinskas, A. Garunkstis, I. Klimkaite, A. Stanaitis), methodological criteria were drawn up for taking inventory of sapropelic sites in the Lithuanian SSR (A. Bunikis, A. Garunkstis, A. Seibutis), topographical studies of the Lithuanian SSR were made (A. Basalikas, O. Sleinite, M. Beconis), and work was completed on an economic-geographic study of the cities of north-central Lithuanian SSR (S. Tarvidas, M. Gudonite).

On the problem "The Genesis of Peat and Peat Bogs," the geographic distribution of sapropelic sites in the Republic was investigated (A. Garunkstis, M. Grigialite).

On the problem "The Development of New and Improved Methods of Geophysical Explorations and Surveying of Minerals" the possibility of measuring magnetic fields by means of M-2 vertical weights was studied experimentally (S. Blinstrubas, H. Gedvilaite), a procedure was proposed for the reverse magnetometric problem in the case of sloping layers at great depths and of finite extent, magnetized in the direction of dip (S. Blinstrubas), and a procedure was worked out for computing H_a from the observed field Z_a on three-dimensional bodies (S. Blinstrubas).

On the problem "The Radiation Balance of the Atmosphere in Individual Parts of the Visible Spectrum," for the first time in the Republic solar radiation was studied in individual parts of the visible spectrum (including the ultraviolet as well) as a function of the sun's height above the horizon and the weather (A. Gričiute).

On the problem "Aspects of Nuclear Meteorology" a procedure was designed for measuring weak sources of soft γ -radiation for the investigation of atmospheric tritium (B. Styro, V. Luianas).

In 1960 the institute sponsored an all-Union conference on the problems of actinometry, atmospheric experimentation, and nuclear meteorology, at which members of the institute presented six scientific papers. Members of the institute presented five scientific reports at international conferences.

In 1960 the institute published six works totaling 143 printer's sheets (2288 pages), including two volumes of review articles on scientific research in geology, geography, and geophysics in the Republic, dedicated to the meetings of the Twenty-First and Nineteenth International Congresses on Geology and Geography, respectively. Six scientific articles appeared in publications of the Academy of Sciences USSR and Academies of Sciences of various Republics in the Union.

Two graduate students of the institute defended their dissertations: U. Kondratene on "Stratigraphy and Paleogeography of the Neopleistocene Period in the Lithuanian SSR from Palinological Data," and M. Kabailene

on "The Basic Features of the Stratigraphy and Paleogeography of the Southeastern Baltic Coastline and Their Comparison with the Neighboring Districts Near the Baltic Sea."

Report on the Institute of Power and Electrical Engineering

(by D. Maciuliavicius)

During 1960 work was done at the institute on four problem areas, covering 26 topics, with the completion of 15 papers.

On the problem "Scientific Bases for the Development of Power Systems and Their Incorporation into a Unified Power System," eight topics were completed. Some of the problems involved in realizing the optimum distribution of active loads in a mixed power system with low-head hydroelectric power plants were investigated (I. Mockus, F. Juska, V. Saltianis); the third issue of the publication Gidroeenergeticheskiye kharakteristiki rek Litovskoy SSR (Hydroelectric Power Characteristics of Lithuanian Rivers) was readied for print (M. Lasinskas, I. Jablonskis); a more precise method was given for determining the cascade parameters of hydroelectric plants in the unified power system (A. Kiasminas); the heat transfer and resistance of bundles of tubes and various objects in a fluid flow were studied (A. Zukauskas, V. Makariavicius, A. Ambraziavicius, A. Slanciauskas); an apparatus for heating water by direct contact with the combustion products was developed and investigated, and certain problems in the utilization of natural gas in industrial furnaces and in homes were studied (M. Zalisauskas, A. Tamulionis, M. Tamonis).

On the problem "Scientific Bases of Automation of Industrial Processes" five topics were completed. A low-power regulated non-reversing magnetic drive with dc motor was investigated (A. Nemura, M. Paulauskas); an automatic voltage regulator for a high-precision dc generator was developed and investigated (S. Vosilius); a photoelectric emitter with many photosensitive elements and a light-revolving instrument to control the optical properties of linen articles on a conveyor were developed and investigated (V. Nesukaitis, J. Storpirstis, M. Stasiulionis); a modulation-type vibration transducer was developed and investigated (V. Nesukaitis, S. Valteris).

On the problem "Increasing the Wearability of Machine Parts" research was conducted on the wear resistance of certain metals and their coatings during rubbing with an abrasive compound (I. Maiauskas, G. Griniute, A. Maciulis).

On the problem "Stepping up Textile Production and Methods for Increasing the Quality of the Fabrics" new scientific methods were developed for determining the quality criteria of teased fabrics (A. Budris, V. Garkauskas).

In extraprovisional studies proposals were submitted to the appropriate governmental agencies for the further development of power

engineering and the mechanical, electrical, and instrument industries of the Republic over a more extended period of time.

Four completed studies were submitted for industrial testing and utilization.

The institute held a scientific and engineering conference on the problems of the mechanization and automation of industrial processes.

Two works with an over-all content of 15.5 printer's sheets (248 pages) were published, along with about 40 scientific articles totaling nine printer's sheets (144 pages).

In 1960 student A. Ambraziavicius defended his candidate's dissertation on the topic "Heat Transfer of a Plate in a Liquid Flow."

Two graduate students finished their terms of study, and six new students were taken in.

In 1960 the institute increased its area by 110 square meters.

Report on the Institute of Construction and Architecture

(by K. Blaziavicius)

Work was carried out at the institute on three problem areas, covering 15 topics, eight of which were brought to completion.

On the problem "Effective Building Materials and Industrial Constructions Using Available Local Raw Materials" four planned topics were completed.

On the topic "Reinforced Concrete and Brick Constructions for the Roofs of Residential Buildings" (P. Buskunas, J. Cesna, M. Girska, and A. Nenorta) the problems of economic constructions of reinforced concrete combined with insulated roofs for residences were studied. One modification of such roofs was raised on a 32-unit apartment house in Kaunas.

On the topic "Exteriors for Domestic Architecture in the Lithuanian SSR" (I. Sabaliauskas, B. Barkauskas, V. Stankiavicius, and K. Ilginis) an attempt was made to find norms for the planning of exteriors for city and rural housing on the basis of local materials. Recommendations for the planning of such exteriors from locally available materials and industrial waste were submitted to planning organizations.

On the topic "Engineering Investigations of Concrete Bricks in Relation to the Hydraulic Modulus of Lime" (B. Vektaris and A. Staniaviciene) the technology of manufacturing concrete bricks from hydraulic lime was investigated. The investigations showed that in the production of concrete bricks Portland cement can be replaced by hydraulic lime.

On the topic "Cross-Sectional Shape and its Effect on the Strength of Pre-Stressed Reinforced Concrete Flexural Elements" (M. Jankauskas and A. Kalinauskas) beams with four types of cross section were studied: rectangular, H-beam, T-beam with the flange on the top, and T-beam with the flange on the bottom. The necessary data were obtained for determining

the supporting capacity of the stressed (compressive) zone of the beam, and certain aspects of limiting reinforcing strain were investigated.

On the problem "Investigation of the Theory of Present-Day Architecture and Architectural Tradition in the Lithuanian SSR, two planned topics were completed.

On the topic "Lithuanian Architecture from the 16th to the 18th Century" (I. Barsauskas, V. Zubovas, and R. Jaloviackas) materials were gathered on the most important traditional architectures of the Renaissance and Baroque periods in Lithuania. The descriptive and iconographic material of the work will be used for educational purposes in the short course "History of Lithuanian Architecture."

On the topic "Principles of Composition in Modern Housing" (I. Barsauskas and I. Minkiaivicius) the problems of composition in cost, color, sizes, and tectonics in housing architecture were studied, along with the combinations of these in multiple units and complex layouts.

On the problem "Investigation of the Planning and Building of Cities and Small Communities in the Lithuanian SSR," two planned topics were completed.

On the topic "Problems of the District Planning of the Lithuanian SSR" (K. Sesialgis, V. Stauskas, and V. Saunoris), the setting up of district planning and future growth of population centers in the Republic was studied. Recommendations were prepared to promote the establishment of a proper method for the organization of district planning.

On the topic "Determination of Optimum Parameters in the Planning and Building of Low-Cost Apartments and Buildings Under Prevailing Conditions in the Lithuanian SSR" (F. Belinskis, V. Sederavicius, and V. Raginis) an investigation of the housing situation, local climatic conditions, cultural and living requirements, and population distribution by families was used as a basis for working out the optimum parameters and basic norms for the planning and building of economically feasible apartments and homes in light of existing conditions in the Lithuanian SSR.

The plan for the regular utilization of the results of scientific research in 1960 provided for the incorporation of five studies, and seven were incorporated, covering the problems planning exteriors for residential buildings under the existing climatic conditions in the Republic, the analysis and planning of flexural reinforced brick units, the construction of reinforced concrete composite insulated roofs for residential buildings, the production of heat insulation from fibrous raw materials, etc.

In 1960 the institute published two papers totaling 30.63 printer's sheets (494 pages), plus 31 articles.

The domestic department of architecture awarded the academic degree of candidate of engineering sciences to P. Buskunas for his dissertation "Lime Carbonate Concrete and Some of its Properties", and two members of the institute were presented with the title of senior scientist.

Four graduate students finished their terms and four new ones were accepted.

In 1960 building was completed on the housing for laboratories

of the institute, covering a total area of 2080 square meters.

Report on the Commission on the History of Natural Science and
Technology, Presidium of the Academy of Sciences Lithuanian SSR

(by N. Eitmanaviciene)

The commission, as is their custom, kept records of research conducted in the Republic on the history of natural science and technology. A total of 547 papers have thus far been recorded. Some of the results of this record appear in the first volume of the publication Iz istorii nauk v Litve /From the History of Science in the Lithuanian SSR/, the remainder, involving 275 papers, have been readied for publication in the second volume of this work, including: 37 on mathematics, astronomy, physics, chemistry, 27 on geography, geology, 42 on engineering and the engineering sciences, 33 on architecture, 26 on the chronology of natural science and technology, etc.

The inventory of historically significant scientific instruments, begun in 1959, is being continued. A total of 83 objects have been recorded, primarily astronomical instruments, sun dials, pendulum clocks, forms of molten lead, and Dutch tile forms from the 19th century, a map from the 18th century, celestial and terrestrial globes, etc.

The members of the commission contributed their reports to a number of commemorative conferences in the Republic, as well as conferences on the history of science, held under the auspices of scientific institutions of other republics and all-Union scientific institutions. At a conference held in honor of the 380th year of Vilnius State University, Prof. Z. Zeimaitis read a report on "The Physical-Mathematical Sciences at the Old Vilnius University," Prof. P. Slavenas on "Astronomy at Vilnius University."

From 25 May to 2 June Prof. P. Slavenas participated in the Conference of Institutions of Higher Learning on the History of Physics and Mathematics, held in Moscow, where he read his report, "Spreading the Teachings of Copernicus and the Science of Astronomy in the Lithuanian SSR." Abstracts of this paper and Z. Zemaitis' report "The Physical-Mathematical Sciences at the Old Vilnius University," which was also read at the conference, appeared in a separate publication of abstracts of the reports of this conference.

At the assembly of the Astronomy Council of the Academy of Sciences USSR in Vilnius on 23 August, Prof. P. Slavenas read his report, "Astronomy in the Lithuanian SSR."

The commission made ready for publication Volume II of the publication Iz istorii nauk v Litve (about 20 printer's sheets -- 320 pages), which is devoted to the history of the applied sciences and the institutions of higher learning in the Lithuanian SSR.

The commission kept up an exchange program with the corresponding commissions in the other Baltic States of the Soviet Union, with the Institute of the History of Natural Science and Technology of the Academy of Sciences USSR, and with its branch in Leningrad. In 1960, the chairman of the commission, Prof. P. Slavenas, was elected member of the Committee of the Soviet National Association of Historians of Natural Science and Technology.

Report on the Geographic Society Lithuanian SSR

(by A. Seibutis)

The Geographic Society Lithuanian SSR was formed on 22 March 1957 under the Institute of Geology and Geography of the Academy of Sciences Lithuanian SSR. The members of the society (numbering more than 140 persons) are geographers, geologists, climatologists from the Academy of Sciences Lithuanian SSR, Vilnius State University, Vilnius Geographic-Pedagogical Institute, the Hydrometeorological Service of the Lithuanian SSR, The Board of Geology and Conservation, and other departments, as well as the directors of intermediate and advanced institutions of learning in the Republic. The primary task of the society is to unify all geographers working in the various Lithuanian institutions, to coordinate their scientific work, to aid and cooperate in a better and more planned study of the geography of the Lithuanian SSR and a more productive scientific-educational program.

On 21 January 1960 a General Convocation of the members was held to evaluate the activity of the society during 1957-1959 and to note the goals to be accomplished in the future. Re-elected to the post of chairman of the society was Academician K. Beliuks, and a new Academic Council of 18 members was elected.

The function of the society was broken down into the following most important trends: physical and economic geography, the history of geography, medical geography, biogeography, mathematical geography, ethnography, propaganda on geography.

The principal activity of the society was conducted in sections. During 1957-1959 more than 90 scientific communications were read and discussed in the various sections: 22 in the meteorology-hydrology section, 17 in the physical geography section, 14 in the economic geography section, 13 in the mapping and surveying section, and so forth.

In addition to the meetings of the sections and general assemblies, scientific conferences and seminars of a broader scope were also held.

In 1957 a conference dedicated to the 40th anniversary of the Great October Socialist Revolution was held under the joint auspices of the society and the Natural Sciences Faculty of Vilnius State University, where members of the society read 18 reports.

In January 1958, on the initiative of the section on educational

geography, a seminar for teachers and administrators in recreation and folklore was held under the joint auspices of the All-Republic Institute of Teacher Education and the All-Republic Tourist-Excursion Headquarters, with the reading of 11 reports on archeology, ethnography, geographic studies, travel, and other problems.

In May 1959 the society joined the Institute of Geology and Geography of the Academy of Sciences and Natural Sciences Faculty of Vilnius State University to sponsor a memorial conference dedicated to the centennial of the death of A. Humboldt, with the presentation of seven scientific reports. The materials of the conference are published in a separate book.

On 11-13 May 1960 the members of the society took active part in a scientific conference sponsored by the Natural Sciences Faculty of Vilnius State University and dedicated to the 20th anniversary of Soviet Lithuania. At the limnological and hydrogeological sections of the conference twelve reports were read: K. Beliukas on "The Classification of Lakes," A. Garunkstis on "Hydrographic Relations of Lithuanian Lakes," S. Zeiba on "The Geological Features of the Klaiped District," J. Dalinkivicius on "The Influence of Tectonic Variations on the Formation of Subterranean Waters in the Southern Baltic Region," and others.

Moreover, members of the society contributed reports to all-Union and all-Republic scientific conferences.

The society publishes the Geograficheskiy yezhegodnik /Geographic Yearbook/ (Volume I in 1958, II in 1959, III in 1960).

The members of the society took an active part in compiling a handbook on geography for teachers. Many of the society's members cooperated in the preparation of Volume I of Fizicheskaya geografiya Litovskoy SSR /Physical Geography of the Lithuanian SSR/, which was awarded the State Prize of the Lithuanian SSR.

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